

REMARKS

Claims 34-37 and 42-45 are pending in the present application. In the Office Action dated March 31, 2006, claim 34 was rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,700,581 to Sachdev et al. ("Sachdev"). Claims 35-37 and 43-45 were rejected under 35 U.S.C. 103(a) as being unpatentable over Sachdev in view of U.S. Patent No. 5,086,018 Conru et al. ("Conru"). Claim 42 was rejected under 35 U.S.C. 103(a) as being unpatentable over Sachdev modified by Conru as applied to claim 35 above, and further in view of U.S. Patent No. 6,266,249 to Desai et al. ("Desai").

The embodiments disclosed in the present application will now be discussed in comparison to the cited references. Of course, the discussion of the disclosed embodiments, and the discussion of the differences between the disclosed embodiments and the cited references, does not define the scope or interpretation of any of the claims. Instead, such discussed differences merely help the Examiner appreciate important claim distinctions discussed thereafter.

An embodiment of the invention is directed to a board-on-chip (BOC) and lead-on-chip (LOC) semiconductor device package assembly. The assembly includes a semiconductor die and a substrate to which the semiconductor die is attached. A tri-layer die attach tape having adhesive die attach material is disposed between the semiconductor die and the substrate. The adhesive die attach material directly abuts the substrate and the semiconductor die. A die attach bondline at the interface between the adhesive die attach material and the semiconductor die is substantially void free.

The Examiner has cited Sachdev for purportedly disclosing a semiconductor assembly including a semiconductor die attached to a substrate with an adhesive material that exhibits a void-free die attach bondline. Sachdev is directed to an improved epoxy for use in attaching semiconductor dies to substrates. As stated in the Background of the Invention in Sachdev, the improved adhesive that Sachdev seeks to develop should have "[a] paste and rheology suitable for automated dispense tools and that these adhesives provide an overall cost reduction in the fabrication of electronic packages." (Sachdev, col. 2, lines 9-12). Sachdev again states, that the "adhesive formulations of this invention are solvent free, have paste rheology and viscosity suitable for autodispense tools" (Sachdev, col. 6, lines 23-27). Thus, the improved adhesives disclosed in Sachdev are designed for rapid dispensing of adhesive onto a

substrate using autodispense tools. As such, even though Sachdev appears to disclose that the adhesive may be void free, Sachdev does not provide a teaching to use the improved adhesive on a tape such as a tri-layer die attach tape. Sachdev teaches away from using adhesive tape because the advantages gained by the improved adhesive of Sachdev, such as the suitable rheology and viscosity for autodispense tools, would not be gained if it were used on an adhesive tape. In fact, the advantages of autodispensing the improved adhesive of Sachdev in a large scale production operation would probably not be realized if it were used in a tape form. While the background of Sachdev cited by the Examiner discloses that adhesives have been used in tape and paste form, this portion of Sachdev does not teach using improved adhesive disclosed in Sachdev that purportedly provides a void-free die attach bondline in tape form. (See, Office Action dated 03/31/06, Page 3, ¶ 4).

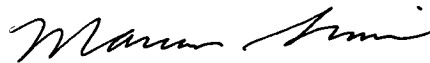
The Examiner has also cited Conru for teaching a tri-layer die attach tape. Although Conru discloses a tri-layer die attach tape, it does not provide any motivation for employing the improved adhesive of Sachdev on a tri-layer die attach tape. As stated above, Sachdev teaches away from using the improved adhesive disclosed therein on a tape. Combining Sachdev and Conru to result in a tri-layer tape having Sachdev's improved adhesive is improper. Accordingly, the combination of Sachdev and Conru would not result in Applicant's embodiment described above.

Turning now to the claims, the patentably distinct differences between the cited references and the claim language will be specifically pointed out. Amended claim 34 recites, in part, "a tri-layer die attach tape comprising adhesive die attach material disposed between the semiconductor die and the substrate, the adhesive die attach material directly abutting the substrate and the semiconductor, a die attach bondline at the interface between the adhesive die attach material and the semiconductor die being substantially void free." There is no motivation or suggestion in Sachdev and Conru to employ the improved adhesive of Sachdev in the tri-layer die attach tape of Conru. In fact, Sachdev teaches away from being combined with Conru in such a manner because the advantages of autodispensing the improved adhesive of Sachdev onto a substrate in a large scale manufacturing operation would likely not be gained if it were used in the tape form of Conru. Claim 42 is patentable for at least the same reasons as claim 34.

Claims depending from claims 34 and 42 are also allowable due to depending from an allowable base claim and further in view of the additional limitations recited in the dependent claims.

All of the claims remaining in the application are now clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,
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Enclosures:

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